

Publication

Handling Uncertainty in Cost-Effectiveness Analysis: Budget Impact and Risk Aversion

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Methods to handle uncertainty in economic evaluation have gained much attention in the literature, and the cost-effectiveness acceptability curve (CEAC) is the most widely used method to summarise and present uncertainty associated with program costs and effects in cost-effectiveness analysis. Some researchers have emphasised the limitations of the CEAC for informing decision and policy makers, as the CEAC is insensitive to radial shifts of the joint distribution of incremental costs and effects in the North-East and South-West quadrants of the cost-effective plane (CEP). Furthermore, it has been pointed out that the CEAC does not incorporate risk-aversion in valuing uncertain costs and effects. In the present article, we show that the cost-effectiveness affordability curve (CEAFC) captures both dimensions of the joint distribution of incremental costs and effects on the CEP and is, therefore, sensitive to radial shifts of the joint distribution on the CEP. Furthermore, the CEAFC also informs about the budget impact of a new intervention, as it can be used to estimate the joint probability that an intervention is both affordable and cost-effective. Moreover, we show that the cost-effectiveness risk-aversion curve (CERAC) allows the analyst to incorporate different levels of risk-aversion into the analysis and can, therefore, be used to inform decision-makers who are risk-averse. We use data from a published cost-effectiveness model of palbociclib in addition to letrozole versus letrozole alone for the treatment of oestrogen-receptor positive, HER-2 negative, advanced breast cancer to demonstrate the differences between CEAC, CEAFC and CERAC, and show how these can jointly be used to inform decision and policy makers.

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